



OPERATING PROCEDURES FOR THE ENGINEERING RUN OF THE PHENIX TIME OF FLIGHT DETECTOR (TOF)

procedure name

PHENIX Procedure No. PP-2.5.2.8-02

Revision: A


Date: 5-10-99

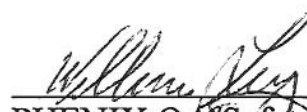
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<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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Approvals

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PHENIX S E & I Date

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REVISION CONTROL SHEET

LETTER	DESCRIPTION	DATE	WRITTEN BY	APPROVED BY	Current Oversight
A	First Issue	5/10/1999	n/a	S. Sato, W Lenz and 1 other unintelligible.	n/a
RETIRED	Engineering Run Completed. This procedure superceded by PP-2.5.2.8-04, Rev A.	3/6/2007	D. Lynch	D. Lynch, P. Gianotti, R. Pisani for the PHENIX experiment	D. Lynch

1.0 Purpose

The purpose of this document is to define the plan for operation of the PHENIX Engineering Run Time of Flight Detector (TOF) in the PEH (PHENIX Experimental Hall) during Engineering run of 1999.

This plan will ensure:

- 1.1 the safety of all personnel from risk associated with the operation of the high voltage system required to power the TOF.
- 1.2 the implementation of the appropriate emergency approaches,
- 1.3 prompt notification of the appropriate RHIC and S&EP specialist,
- 1.4 the maintenance of appropriate RHIC emergency status,
- 1.5 the preservation and protection of the environment, and
- 1.6 the preservation of BNL facilities and equipment.

2.0 Responsibilities

During the ER, there will be two level of responsibility for the oversight of the TOF.

The first level of responsibility will be the PHENIX Shift Crew. Prior to data taking, there will be a period of TOF commissioning when the TOF is tested at high voltage before the IR is closed and the TOF is inaccessible. During this commissioning phase the TOF HV & LV systems will be monitored by the team of TOF Experts every eight hours, at 8:00, 16:00 and 24:00. A record of the performance of the TOF will be kept by the TOF Experts.

During data taking, it will be the responsibility of the PHENIX Shift Crew to:

- 2.1 monitor the status and alarms for the TOF HV system according to a prescribed check of list at least once a shift (eight hours).*
- 2.2 in event of an alarm or irregularity, contact an expert from the Expert Call List given in Appendix A.*

The second level of responsibility is the TOF Experts. It is the responsibility of the

TOF Experts to:

2.3 maintain the TOF in a safe operating condition. This includes:

- 2.3.1 setting, adjusting, and checking the HV and LV power supplies,
- 2.3.2 posting any special instructions or notifications as required, and
- 2.3.3 carrying out any emergency actions, as prescribed in the Procedures section of this document.

3.0 Prerequisites

The TOF Experts shall have read or have training in the following areas:

- 3.1 RHIC Project Local Emergency Plan, RHIC-OPM 3.0,
- 3.2 BNL Electrical Safety I, Rad Worker I & TLD.
- 3.3 BNL Lock Out/Tag Out Authorized Training,
- 3.4 PHENIX TOF specific training, RHIC Access training, PHENIX IR Access training
- 3.5 geographical layout of the experimental area (routes of egress, location of emergency equipment, phones and controls)

The TOF Experts shall train all personal involved in the TOF running in the safe operation of the TOF HV & LV system.

4.0 Preparation

4.1 HV system precautions

The HV power supplies are current limited at less than 30 milliamp per boards. All HV points are enclosed within the protection containers in order to eliminate the danger to personnel. When the doors of containers are closed the HV points are inaccessible to personnel. When TOF is being tested and HV is on the TOF, there will be yellow tape barrier and an HV warning sign posted around the TOF to indicate to personnel that they need to keep their distance. When the IR is closed no barriers or warnings

will be required.

4.2 LV system precautions

TOF utilizes high current low voltage power supplies to provide power required by FEM crates to operate. This power is delivered from the LV power supply rack to the detector and distributed. Because the voltage is low, LV wires may stay energized while TOF FEM Testing Warning is posted to allow test-work on FEM crates.

5.0 Standard Operating Procedures

5.1 HV System Procedures: In normal operation the experimental hall will be closed to personnel making access to any HV point impossible. Under such conditions, follow this procedure for turning on the HV to TOF:

5.1.1 Check that the appropriate current limits are in place for the main channel of each HV module (CAEN - A938 AN), and check that the appropriate HV limits are in place both for the main channel and each sub channel. The TOF Experts and personnel assigned to operate the TOF HV shall maintain a HV logbook where the operating parameters of the HV setting are recorded. This shall include:

5.1.1.1 Appropriate relation in voltage between main channels and their sub channels (main channel voltage must be 50 volts (or more) higher than the maximum voltage of their sub channels, in order to get stable voltage supply on the sub channels. Note that this is the CAEN HV hardware characteristics),

5.1.1.2 Appropriate current limit (main channels),

5.1.1.3 Appropriate voltage limit
(main channels, sub channels),

5.1.1.4 Target voltage
(main channels, each sub channel),

- 5.1.1.5 Operating current (main channels),
- 5.1.1.6 Operating voltage
(main channels, each sub channels),
- 5.1.1.7 Ramp rates,
- 5.1.1.8 Trip tolerance,

5.1.2 Check that the target voltage for each HV output line is appropriate (<1851V for main channels, <1801V for sub channels). The first stage of bringing on the HV shall be a single increment in the ramp up. This is because the current trips are disabled during ramping, and in order to locate a short in the system, it is necessary to halt the ramping and check the current at the earliest stage.

5.1.3 Check that the ramp up rate for each channel is appropriate (<500 volts per step).

5.1.4 Place the "HV ON" sign in a prominent position.

5.1.5 Begin ramping up the HV.

5.1.6 If any of the HV supplies trips, disable the channel and all other channels in the same module until the reason for the trip is understood. Then begin the procedure again from 6.1.5.

5.1.7 If there are no HV trips, verify that the operating currents are appropriate.

5.1.8 Change the target voltage to the correct operating voltage for each channel, as given in the operating log for each channel.

5.1.9 Continue ramping up the HV.

5.1.10 When ramping is complete, verify that the operating currents (for main channel) and voltage (both for main channels and for sub channels) are appropriate, as given in the operating log.

5.1.11 HV is ready for TOF testing.

5.2 HV System Procedures: Turning off high voltage to the TOF:

5.2.1 Begin ramping down the HV.

5.2.2 Verify by the read back that the HV is off the system.

5.2.3 Remove the "HV ON" sign.

5.3 TOF HV cable and HV distribution box mating / unmating procedure:

5.3.1 To make the connector on HV cable UNMATED with the high voltage distribution box, take the following procedure.

5.3.1.1 The interlock terminator (50 ohm) on the backside of the HV module should be taken out.

5.3.1.2 Check the LED on the front panel of the HV module. The LED must be OFF.

5.3.1.3 Make the connector unmated with the box.

5.3.2 To make the connector on HV cable MATED with the high voltage distribution box, take the following procedure.

5.3.2.1 The interlock terminator (50 ohm) on the backside of the HV module should be taken out.

5.3.2.2 Check the LED on the front panel of the HV module. The LED must be OFF.

5.3.2.3 Make the connector mated with the box.

5.3.2.4 Put a interlock terminator (50 ohm) on the backside of the HV module.

5.4 TOF HV distribution box opening / closing procedure:

5.4.1 To open the high voltage distribution box, take the following procedure.

5.4.1.1 Follow "TOF HV cable and HV distribution box unmating procedure".

5.4.1.2 Open the HV distribution box.

5.4.2 To close the high voltage distribution box, take the following procedure.

5.4.2.1 Follow "TOF HV cable and HV distribution box unmating procedure".

5.4.2.2 Close the HV distribution box.

5.4.2.3 If need to make HV cable and HV distribution box mated again, follow "TOF HV cable and HV distribution box mating procedure".

6.0 Documentation

6.1 None

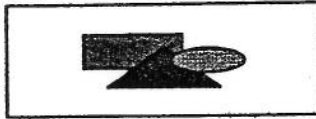
7.0 Reference

- 7.1 RHIC-OPM 3.0, "Local Emergency Plan for the Relativistic Heavy Ion Collider Project."
- 7.2 BNL ES&H Health Standard, December 18, 1991.
- 7.3 BNL Occupational Health and Safety Guide (Interim).

Appendix A:

Call list for the TOF experts

- | | |
|-------------------|-----------|
| 1. Susumu SATO | x-1144, |
| 2. Akio KIYOMICHI | x-1079, |
| 3. Miwako SUZUKI | 345-3602. |



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